

Case Report

Thrombectomy of the Superior Mesenteric Vein for the Treatment of the Small Bowel Gangrene

Ihnatovich I* and Ihnatovich K

Educational Institution "Belarusian State Medical University", Belarus

*Corresponding author

Ignatovich IN, Educational Institution "Belarusian State Medical University", Minsk, Belarus, Email: ini67@inbox.ru

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Abstract

The traditional definition of tissue ischemia - a decreased level of oxygen deliverability by the bloodstream that results in cell hypoxia. Anatomical and functional obstruction of blood flow is the basis of tissue hypoperfusion. Arterial, venous, and functional disturbances in blood circulation lead to acute intestinal ischemia.

INTRODUCTION

In 85-90% of cases, acute mesenteric ischemia is caused by arterial reasons: thrombosis or embolism. Venous thrombosis is responsible for 10-15 % of acute mesenteric ischemia cases. Hereditary or acquired coagulopathy disorders – deficiency of protein C or ATIII – are at the core of mesenteric veins primary thrombosis. The first publication describing convalescence after resection of necrotic bowel caused by mesenteric vein thrombosis was by Elliot in 1895 [1]. In the majority of cases, mesenteric ischemia is caused by superior mesenteric vein thrombosis that sometimes extends over the portal vein [2]. Acute presentation accounts for less than 20% of cases and diffuse abdominal pain may have been present for days or weeks [3]. Abdominal pain, anorexia, and diarrhea are the most common presenting symptoms. Unspecific abdominal pain is often present in the early stage of the disease, whereas localized abdominal tenderness develops later. Melaena, hematemesis, or hematochezia occur in only about 15% [4]. Thrombosis often results in bowel gangrene (33-45%) if left untreated [5].

The following example shows specific treatment techniques for this difficult pathology. The treatment protocol was approved by the University ethics committee (No. 20140451) and patient signed a written informed consent to surgery.

CASE PRESENTATION

A 71 years old woman presented to the emergency department with epigastric pain of one-day duration, nausea, and single vomiting. She suffered from deep vein thrombosis 10 years ago. The cause of pain syndrome was not revealed by

laboratory methods, abdominal X-ray, ultrasonography, and fibrogastroduodenoscopy. In 24 hours pain syndrome was arrested and the ache did not resume; the patient was discharged for outpatient treatment. A day later she was hospitalized once again due to recurrence of abdominal pain. On physical examination, moderate abdominal distention was observed. Dilated loops of the small bowel and a moderate amount of liquid in the abdominal cavity were detected by repeated ultrasonograms. The spiral CT of the abdomen with bolus contrast enhancement was planned in a few hours, but the condition of the patient deteriorated. Abdominal pain diminished while peritoneal signs appeared in the hypogastric region. Blood pressure was 100/60. On rectal examination blood in stool was detected.

The indications for immediate laparotomy were identified. The laparotomy revealed a moderate amount of hemorrhagic exudate and marked edema of the small bowel wall. 40 cm distally from Treitz's ligament part of the small bowel was of dark-purple color, edematous with absent peristalsis and hyperemic mesentery (hemorrhagic gangrene). The length of hemorrhagic gangrene was approximately 1 meter. Resection of necrotic bowel was performed (Specimen 1). The proximal bound of gangrene was within the limits of the jejunum therefore it was extremely objectionable to make jejunostomy even for a short period of time. Making anastomosis after bowel resection was rather risky because of edema of the bowel wall. Performing safe primary anastomosis was demanded to restore blood flow in the bowel wall. Having performed section of necrotic bowel, mesentery veins with organized thrombotic masses in them were found. These veins were used as access to the superior mesenteric vein system (Figure 1). Thrombectomy from the superior mesenteric

vein and its distant branches was performed using the Fogarty catheter (Figure 2).

30 minutes after thrombectomy active peristalsis and diminished swelling were observed in the remaining part of the small bowel. The diameter of the proximal edge remained two times bigger than the distal one. Superior mesenteric artery pulsation was satisfactory, without systolic murmurs over it. Stapled Jeuno-jejuna side-to-side anastomosis was performed, followed by control of hemostasis, lavage, sanitation, and draining of the abdominal cavity. The operational wound was sewed up. Figure 2 shows the operation scheme.

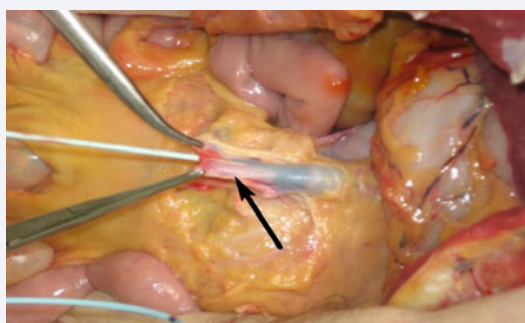


Figure 1 Vein of the intestine mesentery (arrow) as access for thrombectomy from the superior mesenteric vein (cadaveric model).

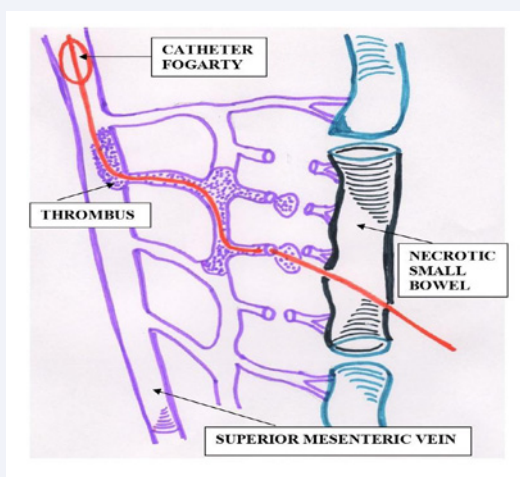


Figure 2 Graphic scheme of access to the superior mesenteric vein for thrombectomy.

The microscopic picture of specimen #1. Diffuse extravasation and leukocyte infiltration of the bowel wall. The mucosa was necrotic, the serous coat was covered with fibrin and leukocytes. Mesenteric vessels were plethoric. The microscopic picture of specimen #2. Histologic features of thrombus.

Diagnosis after surgery: Idiopathic segmental venous thrombosis in the system of the superior mesenteric vein. Hemorrhagic gangrene of small bowel. Peritonitis.

The postoperative period was uncomplicated. Recovery of peristalsis was observed on the second day after surgery, the stool of normal color was passed on the 4th day. Post-operation wound healed by primary intention. The patient received long-term warfarin therapy and had a good quality of life during 5 years follow-up.

CONCLUSION

This clinical case demonstrates the difficulties in diagnosis of mesenteric veins thrombosis until bowel gangrene and peritonitis develop. Moreover, it emphasizes the possibility of surgical thrombectomy from the superior mesenteric vein. Thrombectomy performs a favorable impact on bowel blood circulation and allows making primary anastomosis after resection. Thrombectomy prevents the progression of thrombosis and bowel necrosis. Thrombosed veins of the mesentery of the affected bowel, discovered during its mobilization and resection, can be used as access to the superior mesenteric vein system. This method of thrombectomy is simple and effective.

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